

CLAIMS

1. An exhaust heat recovery power generation device (200) comprising:
an exhaust pipe (110) receiving exhaust gas (15) from a heat source (10) and
5 passing the exhaust gas in a prescribed direction;
a cooling pipe (265) arranged along said exhaust pipe to pass a refrigerant for
cooling said exhaust pipe;
a refrigerant supply unit (230) supplying said cooling pipe with said refrigerant;
and
10 a plurality of thermoelectric power generation units (210) attached to said
exhaust pipe and said cooling pipe sequentially in a direction in which said exhaust gas
flows, wherein:
said plurality of thermoelectric power generation units each generate power
corresponding to a difference in temperature between a high-temperature end (271) and
15 a low-temperature end (272) thereof, said high-temperature end and low-temperature
end being attached to said exhaust pipe and said cooling pipe, respectively, at a
corresponding site; and
said refrigerant supply unit are configured to supply said refrigerant in such a
direction that said exhaust pipe and said cooling pipe pass said exhaust gas and said
20 refrigerant, respectively, in opposite directions.
2. The exhaust heat recovery power generation device (200) of claim 1,
wherein:
said plurality of thermoelectric power generation units (210) each include a
25 plurality of thermoelectric power generation elements (270) formed sequentially in the
direction in which said exhaust gas flows; and
said high-temperature end (271) and low-temperature end (272) are attached to
said exhaust pipe (110) and said cooling pipe (265), respectively, at a corresponding site.

3. The exhaust heat recovery power generation device (200) of claim 2, wherein each of said thermoelectric power generation elements (270) is arranged to be sandwiched between said exhaust pipe (110) and said cooling pipe (265).

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4. An automobile comprising:

a first driving force generation device (10) using a fuel's combustion energy as a source to generate wheel driving force;

10 the exhaust heat recovery power generation device (200) as recited in any of claims 1-3, said exhaust heat recovery power generation device generating power with said first driving force generation device serving as said heat source; and

a source of electric power (20); and

15 a second driving force generation device (80) using power generated by said exhaust heat recovery power generation device and that supplied from said source of electric power as a source to generate wheel driving force.

5. The automobile of claim 4, wherein:

said source of electric power (20) is a secondary battery; and

20 said exhaust heat recovery power generation device further includes a power converter (220) converting the power generated by said exhaust heat recovery power generation device (200) to voltage charging said secondary battery.

25 6. The automobile of claim 4, further comprising a driving power conversion device (30) converting received power to power driving said second driving force generation device (80), wherein said exhaust heat recovery power generation device (200) further includes a power converter (220) converting the power generated by said exhaust heat recovery power generation device to power input to said driving power conversion device.

7. The automobile of claim 4, further comprising:

a power generation device (70) converting at least a portion of said wheel driving force generated by said first driving force generation device (10) to power usable as power driving said second driving force generation device (80); and

a control device (90) operative to drive said automobile in accordance with a driver's instructions, wherein:

said source of electric power (20) is a secondary battery; and

said control device considers vehicle requirement power (P_v) calculated in accordance with said driver's instructions and required to run the vehicle and charge requirement power (P_{chg}) for maintaining a level of charge of said secondary battery and in addition thereto power (P_h) generated by said exhaust heat recovery power generation device (200) to control said first driving force generation device's operation.